February 1980

A.E. Res. 80-1

DAIRY MANAGEMENT PRACTICES AND NEW YORK DAIRY FARM INCOMES 1978

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Foreward

This publication is part of a study supported by a special temporary grant to the Agricultural Experiment Station at Cornell University by Agway, Inc., of Syracuse, New York.

Dairy management practices are one area of factors that affect dairy farm incomes. In the past, economic information related to these practices has been scarce. Data available from the New York dairy herd improvement records and the farm business management projects at Cornell have been merged for the past five years and used to study the effects of dairy management practices on farm incomes.

The 1978 report is an update of similar studies done for the years 1974, 1975, 1976, and 1977*. Some comparisons and generalizations have been made based on the information for the five years studied.

The author wishes to acknowledge the encouragement given by Dr. Lewellyn B. Mix of Agway to pursue the investigation and publish the findings related to dairy management practices and the apparent effects on the incomes from New York dairy farm businesses. James Lamkey, a student in the College of Agriculture and Life Sciences at Cornell, did the statistical work on the 1978 data.

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* Results from the earlier years are available in Cornell Agricultural Economics Staff Paper 75-27; A.E. Res. 77-20; A.E. Res. 78-19; A.E. Res. 79-5; and A.E. Res. 79-14.

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Introduction

Dairy farm incomes are affected by many things. Farm management studies have identified general factors such as size, rates of production, labor efficiency, capital efficiency, and cost control as being related to farm incomes. In addition there are many practices which affect or determine these "general" management factors. An example is dairy management practices which affect rates of production and cost control. These traditionally have not been analyzed in dairy farm business studies.

Computer technology has added new dimensions to farm management studies. Computer facilities have made it possible to expand the kind and amount of information available to dairy farmers from their dairy herd improvement (DHI) production records. Likewise, farm business management summaries have been expanded since computer programs have been developed to summarize and analyze the data. These changes have brought new management "tools" to dairymen.

In 1974 a pilot project was initiated to merge for analysis purposes the DHI dairy management practice information with the farm management business summary information. The project proved to be workable and the procedure has been repeated each year since. This publication reports the results from the 1978 data and includes some comparisons with the four earlier years.

Purpose of the Study

The purpose of this study was to determine the effects of dairy management practices on dairy farm incomes. In brief, it is to determine how the recommended dairy management practices actually pay on operating dairy farms in New York State.

Methodology

Two sources of summary data on individual dairy farm operations which had both farm business records and dairy herd improvement records were merged on computer tapes for analysis purposes.

A computer listing was made of the dairy farm business records summarized by the Department of Agricultural Economics which indicated they had dairy production records. This list was matched with the DHI records available in the Department of Animal Science. Information from the DHI records was then merged with the business management data for each farm. Computer programs were used to sort the data according to various groupings and average values for all factors in the group were computed. These data are presented in this report in cross tabulation tables.

Definitions of Measures Used

Four measures used in the farm business summaries, and fifteen measures from the dairy herd improvement records are defined below.

Labor and management income per operator reflects the dollar return to the farmer-operator for his time, knowledge and skills in operating the farm business unit. For calculation details, see Cornell's A.E. Res. 79-6.

Milk sold per cow is the total pounds of milk sold for the year divided by the average number of cows.

Average number of cows measures herd size and is the 12-month average of the milk cows reported monthly in the farm business records.

Number of cows per person is calculated by dividing herd size by the person equivalent. This includes all persons working on the farm.

Milk produced per cow is the total pounds of milk produced by each cow as computed from the twelve monthly dairy herd improvement sample weights. The herd average was used in this study for all dairy management practices.

Butterfat test is the herd average for the twelve monthly dairy herd improvement samples tested.

Concentrates fed is the yearly average pounds of concentrates fed per cow in the herd. The D.H.I. supervisor records the pounds of concentrates fed each month and these are aggregated for the yearly figures.

The percent net energy figures are calculated for concentrates, succulants (silages), dry hay, and pasture. It reflects the relative amount of available therms (calories) the cow gets from each source.

Body weight of all cows is rounded to the nearest ten pounds. This measure indicates the average weights of all cows in the herd during the year. Body weights are obtained by taping the animal.

Body weight at first calving is rounded to the nearest ten pounds. Weight at first calving is likely to be lower for heifers that calve earlier.

Age at first calving is expressed in months and is recorded by the DHI supervisor.

Projected minimum calving interval is the herd average of the number of months between calves.

Breedings per conception is the number of times a cow is bred.

Days dry is the number of days a cow is not milked per calving interval.

Percent of days in milk is the number of days milked divided by the number of days on test (usually 365).

Percent leaving the herd is the number of cows leaving the herd for non-dairy purposes divided by the herd size.

Age of all cows is the average age in months of all milk cows in the herd during the year. Heifers are not included.

The feeding index equals the reported total net energy fed per cow divided by the "calculated" maintenance and production requirements.

Income over value of feed is the computed value of the milk produced minus the value of all feed fed. Value of feed is calculated by the farmer and DHI supervisor. This measure is based on only one cost variable, namely, feed.

Farms Studied

Cooperators in the farm business management project participated on a voluntary basis. Consequently, the average of the farms in the project tends to be better than the average of all farms in the State. Similarly, cooperators who have DHI records tend to be operating somewhat better than average farms. A comparison of the farms is shown in Table 1.

Table 1. COMPARISON OF ALL FARMS IN THE BUSINESS MANAGEMENT SUMMARY WITH FARMS IN THE DAIRY MANAGEMENT PRACTICES SUMMARY New York Dairy Farms, 1974 through 1978

Item	Business Year Of				
	1974	1975	1976	1977	1978
New York Crop Reporting Service					
Lbs. milk produced per cow NY	10,800	10,900	11,200	11,200	11,600
Business Management Summary					
Number of farms	628	605	615	570	527
Average number of cows	72	72	71	71	71
Lbs. milk sold per cow	12,600	13,000	13,400	13,600	14,000
Labor & Mgt. Income/Operator	$4,880	$3,703	$7,960	$3,049	$20,047
Dairy Management Practices Summary					
Number of farms	413	380	337	363	370
Average number of cows	74	74	70	69	68
Lbs. milk produced per cow	13,700	14,200	14,500	14,800	15,200
Lbs. milk sold per cow	12,900	13,500	13,700	14,100	14,400
Labor & Mgt. Income/Operator	$5,032	$3,946	$8,080	$3,178	$20,980

The pounds of milk produced per cow by the farms in the dairy management practices summaries were from 2,900 pounds in 1974 to 3,600 pounds in 1977 and 1978 higher than the average pounds of milk produced per cow reported by the New York Crop Reporting Service. Similarly, the dairy management practices summary farms sold from 300 to 500 pounds more milk per cow than the average of all farms in the business management summaries. In general, the farms included in the dairy management practices summary were considerably better than the average of all farms in the State.

Analysis of Farm Business Management Variables

The relationship between production practices and financial measures was examined by sorting first one then the other and observing the effects. Background material such as percent of farms in each group and average herd size in each group are given to orient the reader. The 1978 data are reported in the tables presented in this publication, along with a few comparisons with the four earlier years studied.

The findings of this study can be used for policy considerations in New York State, for individual use by farmers to compare their performance to the norm, and for showing the basic relationships of dairy management practices to milk sold per cow and to labor and management income per operator.

Labor and Management Income Per Operator and Herd Size

Labor and management income per operator is the most common measure of success used in studying farm businesses. It is also an indication of the "managerial ability" of the operator since it is the result of his skill in combining all elements into a business unit. It measures how well the operator was able to "put it all together".

Table 2. DISTRIBUTION OF 1978 LABOR AND MANAGEMENT INCOMES PER OPERATOR
370 New York Dairy Farms

Labor and Management Income Per Operator*	Farms		Average Number of Cows
	Number	Percent	
Minus (less than 0)	27	7	61
$ 1 to $ 4,999	21	6	48
$ 5,000 to $ 9,999	31	8	56
$10,000 to $14,999	63	17	58
$15,000 to $19,999	52	14	65
$20,000 to $24,999	49	13	63
$25,000 to $34,999	66	18	73
$35,000 or more	61	17	97

* Differs from classes used in Table 3 for earlier years.

The labor and management incomes on the 370 farms for 1978 averaged $20,980 and was the highest of the five years studied. The year 1976 was second with $8,080 followed by $5,032 for 1974, $3,946 for 1975, and $3,178 in 1977. Increases in dairy cow prices in 1978 was a major factor affecting incomes in 1978. When the effects of the increase in dairy cattle prices were excluded average incomes for 1978 were about double those of 1977 (See A.E. Res. 79-6).

Even with the relatively high incomes in 1978, seven percent of the farms had minus labor and management incomes (Table 2). This means that when all other costs including opportunity costs such as interest on equity capital were subtracted from total receipts there was no return left to the operator for his efforts. For the other four years the percent of farms with minus incomes ranged from 22 in 1976 to 36 in 1975 (Table 3). At the other extreme in 1978, seventeen percent of the farms had labor and management incomes of $35,000 or more.

Table 3. LABOR AND MANAGEMENT INCOME PER OPERATOR AND RELATED FACTORS
New York Dairy Farms, 1974 through 1977

Labor & Management Income Per Operator	Percent of Farms				Average Number of Cows			
	1974	1975	1976	1977	1974	1975	1976	1977
$-5,000 or less	18	21	12	21	75	78	65	71
$-4,999 to $-1	15	15	10	13	60	63	59	67
0 to $ 4,999	18	22	19	21	70	61	67	61
$ 5,000 to $ 9,999	20	17	21	21	63	71	64	63
$10,000 to $14,999	14	11	15	11	71	74	64	62
$15,000 to $19,999	7	8	11	6	87	85	71	81
$20,000 & over	8	6	11	6	128	127	106	116

As the income increased the average size of herd tended to increase. This suggests that in general the better managers had larger herds. The minus income groups were an exception. The fact that the farms with losses had larger herds seems to indicate that when larger farms are poorly managed the chances of losses are greater. The multiplier effect operates both with profitable and unprofitable businesses.

Table 4. HERD SIZE AND DISTRIBUTION OF FARMS
New York Dairy Farms, 1974 through 1978

Number of Cows	Percent of Farms				
	1974	1975	1976	1977	1978
Under 40	10	11	12	13	14
40 to 54	29	26	28	28	29
55 to 69	22	23	25	23	21
70 to 84	12	12	13	15	13
85 to 99	7	8	7	6	6
100 to 149	14	14	10	10	14
150 & over	6	6	5	5	4

When these dairy management practice study farms were sorted by herd size about one-half had from 40 to 69 cows (Table 4). The distribution was similar for each of the five years 1974 through 1978. There were four to six percent of the farms each year that had 150 or more cows.

Table 5. HERD SIZE AND LABOR AND MANAGEMENT INCOME PER OPERATOR
New York Dairy Farms, 1974 through 1978

Number of Cows	Labor and Management Income Per Operator				
	1974	1975	1976	1977	1978
Under 40	$ 2,540	$1,348	$ 2,932	$(126)	$12,083
40 to 54	2,698	2,479	5,955	2,540	16,859
55 to 69	2,482	3,590	7,208	2,269	18,234
70 to 84	3,841	45	9,346	4,918	21,355
85 to 99	10,539	5,347	7,898	4,724	27,945
100 to 149	7,308	8,870	13,223	6,515	30,181
150 & over	14,853	8,548	15,462	4,645	38,659

In general, the average labor and management incomes per operator showed a positive correlation with herd size (Table 5). This was true for each of the five years studied. In 1978 the average income for the farms with 150 or more cows was more than three times that of those with under 40 cows ($38,659 vs $12,083). These results are consistant with the findings of most dairy farm management studies. Size is a dominant factor affecting dairy farm incomes.

Milk Sold Per Cow and Herd Size

Business management studies have shown that milk sold per cow is one of the important variables affecting labor and management incomes on dairy farms. It is assumed that milk sold per cow is directly affected by most dairy management practices. Consequently, in this study milk sold per cow has been used along with income as a measure to relate to each practice studied. In this section, the factor of milk sold per cow is examined as it relates to size of herd.

Table 6. MILK SOLD PER COW AND DISTRIBUTION OF FARMS
New York Dairy Farms, 1974 through 1978

Milk Sold Per Cow	Percent of Farms				
	1974	1975	1976	1977	1978
Under 10,000	8	4	4	4	2
10,000 to 10,999	10	6	5	5	4
11,000 to 11,999	14	16	10	7	6
12,000 to 12,999	20	16	18	15	14
13,000 to 13,999	23	23	20	22	19
14,000 to 14,999	16	17	23	17	19
15,000 to 15,999	6	11	13	18	20
16,000 & over	3	6	7	12	15

The average pounds of milk sold per cow increased from 12,900 in 1974 to 14,400 in 1978 or an average of 300 pounds per year. The distribution of the farms in this study by the pounds of milk sold per cow is shown for each year from 1974 through 1978 in Table 6. There appears to have been a definite trend toward more farms in the higher producing groups. In 1974 only three percent of the farms sold 16,000 or more pounds of milk per cow but in 1978 fifteen percent were in this group. At the other extreme, in 1974 eight percent of the farms sold under 10,000 pounds of milk per cow but in 1978 this had dropped to only two percent of the farms.

Table 7. MILK SOLD PER COW AND AVERAGE NUMBER OF COWS
New York Dairy Farms, 1974 through 1978

Milk Sold Per Cow	Average Number of Cows				
	1974	1975	1976	1977	1978
Under 10,000	71	53	48	49	49
10,000 to 10,999	68	72	57	56	53
11,000 to 11,999	70	64	59	53	57
12,000 to 12,999	75	74	66	59	63
13,000 to 13,999	73	79	75	74	69
14,000 to 14,999	77	74	77	76	79
15,000 to 15,999	88	87	71	79	69
16,000 & over	74	76	71	69	68

The average number of cows for each of the eight groups sorted according to milk sold per cow are reported in Table 7. It appears that generally the farms selling more milk per cow also had more cows or were larger. There was a tendency for those selling 16,000 pounds and over to be somewhat smaller in size than the groups from 13,000 to 15,999. All three groups selling less than 12,000 pounds per cow averaged fewer cows per farm than those selling over 13,000 pounds per cow.

The relationship of milk sold per cow and size of herd shown in Table 7 may indicate that the dairymen with larger herds give more attention to dairy management practices which affect production per cow than do those with smaller herds. To check further on this, the farms were sorted on the basis of size of herd, and as shown in Table 8 the larger herds did sell more milk per cow.

Table 8. HERD SIZE AND MILK SOLD PER COW
New York Dairy Farms, 1974 through 1978

Average Number of Cows	Average Pounds of Milk Sold Per Cow				
	1974	1975	1976	1977	1978
Under 40	12,788	13,059	13,281	13,572	13,853
40 to 54	12,765	13,520	13,460	13,776	14,015
55 to 69	12,707	13,013	13,549	13,857	14,354
70 to 84	12,823	12,997	13,862	14,589	14,637
85 to 99	13,156	13,384	14,020	14,174	14,597
100 to 149	13,236	13,803	14,154	14,323	14,337
150 & over	12,965	14,017	14,201	14,577	14,702

Three factors were chosen from the 1978 study to further examine the relation of herd size and rates of production. The factors were: cows per person which measures labor efficiency; pounds of concentrates fed per cow, a feeding practice; and average days dry which is a breeding practice.

Table 9. HERD SIZE AND SELECTED FACTORS
370 New York Dairy Farms, 1978

Average Number of Cows	Average Cows Per Person	Pounds of Concentrates Fed Per Cow	Average Days Dry
Under 40	19	5,505	65
40 to 54	24	5,745	62
55 to 69	27	5,879	59
70 to 84	28	6,588	60
85 to 99	34	6,411	58
100 to 149	32	6,425	57
150 & over	34	6,709	56
	(increases)	(increases)	(decreases)

The larger herds had better labor efficiency as measured by cows per person (Table 9). The farms with 40 or less cows averaged 19 cows per person equivalent, while those with 150 or more averaged 34 cows per person, or 80 percent more. The larger herds fed more concentrates per cow. The herds with 150 or more cows fed an average of 6,709 pounds per cow, while those with 40 or less cows only fed 5,500 pounds per cow. The average days dry was related to size of herd with the larger herds having fewer days dry per cow.

Labor and Management Income Per Operator and Milk Sold Per Cow

The Pearson correlation analysis made in 1976 showed an r value of .26 between the two major output variables, labor and management income per operator and milk sold per cow. This means there are many other factors involved in specifying these variables; however, the fact the relation is positive indicates that as one factor increases the other does too.

Table 10. LABOR AND MANAGEMENT INCOME PER OPERATOR AND MILK SOLD PER COW 370 New York Dairy Farms, 1978

Labor and Management Income Per Operator*	Pounds Milk Sold Per Cow
Minus (less than 0)	13,838
$ 1 to $ 4,999	13,692
$ 5,000 to $ 9,999	13,895
$10,000 to $14,999	14,105
$15,000 to $19,999	14,408
$20,000 to $24,999	14,273
$25,000 to $34,999	14,700
$35,000 & over	14,618

* Differs from classes used in Table 11 for earlier years.

In 1978 as the labor and management income per operator increased, the pounds of milk sold per cow tended to increase (Table 10). The farms with incomes of $25,000 to $35,000 per operator sold 14,700 pounds of milk per cow while those with incomes of $1 to $5,000 sold 13,700 or 1,000 pounds less per cow. This suggests that the "good managers" or those with better incomes did sell more milk per cow.

The relationship between income per operator and pounds of milk sold per cow that existed in 1978 also existed in the years 1974 through 1977. As shown in Table 11, the differences in milk sold per cow between the low and high income groups were even greater in the earlier years than for 1978 (i.e. in 1974, 14,200 vs 12,200 or 2,000 pounds difference).

Table 11. LABOR AND MANAGEMENT INCOME PER OPERATOR AND MILK SOLD PER COW New York Dairy Farms, 1974 through 1977

Labor & Management Income Per Operator	Pounds Milk Sold Per Cow			
	1974	1975	1976	1977
$-5,000 or less	12,204	12,978	12,752	13,785
$-4,999 to $-1	12,247	12,705	12,817	13,542
0 to $ 4,999	12,519	13,436	13,430	14,246
$ 5,000 to $ 9,999	13,113	13,662	13,836	13,975
$10,000 to $14,999	13,276	14,315	13,948	14,484
$15,000 to $19,999	13,608	13,935	14,375	14,636
$20,000 & over	14,276	14,128	14,679	14,834

In general, for the five years studied, the higher income farmers had higher producing cows (Tables 10 and 11), and the more production per cow the higher the income as measured by labor and management income per operator (Table 12). The drop in labor and management income per operator in the highest production groups (16,000 & over pounds per cow) for 1974 through 1976 may be due to an over concentration of effort in one practice (production) with a consequential neglect of other practices such as cost control. This phenomenon of over concentration in one area appears in other parts of this study.

An examination of labor and management income per operator, milk sold per cow in relation to the selected production practices, will help operators select a package of practices that will increase their dollar returns from the dairy business. In this study, only the production practices were analyzed, but efficient operation of all phases of a dairy enterprise is required for a profitable operation. The effects of general farm business management factors on income for 1978 are reported in Cornell A.E. Res. 79-6.

Table 12. MILK SOLD PER COW AND LABOR AND MANAGEMENT INCOME PER OPERATOR
New York Dairy Farms, 1974 through 1978

Milk Sold Per Cow	Labor & Management Income/Operator				
	1974	1975	1976	1977	1978
Under 10,000	$-4,574	$-5,343	$-2,760	$-6,585	$10,193
10,000 to 10,999	300	-2,404	516	-2,990	3,584
11,000 to 11,999	143	1,323	3,836	3,534	19,769
12,000 to 12,999	4,999	794	4,536	-35	18,503
13,000 to 13,999	7,052	5,847	10,526	4,151	19,487
14,000 to 14,999	8,980	6,280	9,061	5,606	23,752
15,000 to 15,999	13,105	8,943	13,649	4,294	22,413
16,000 & over	11,045	6,548	11,834	5,370	25,154

Production Variables and Labor and Management Incomes

The Pearson correlation analysis made for 1976 showed only a small direct relation between the production variables and labor and management income per operator, due to the masking effect of several important financial management measures. Concentrate fed per cow, income over value of feed, and average body weight of all cows showed a relatively high correlation with pounds of milk sold per cow (Table 35, A.E. Res. 77-20). An examination of the tables that follow will provide an intuitive understanding of the effects of the production variables on the two output measures used in this analysis, namely, labor and management income per operator, and pounds of milk sold per cow.

The analysis of dairy herd improvement variables which follow is divided into three general classifications; feeding practices, breeding practices, and culling practices.

Analysis of Feeding Practices

Concentrates fed; percent net energy from concentrates, succulents, and hay; average body weight of all cows; and average body weight at first calving are examined in this section.

Concentrates Fed Per Cow

Concentrates fed per cow in 1976 had a Pearson correlation value of .51 with milk sold per cow indicating a definite, increasing relationship. The more concentrates a cow was fed, the more milk she gave; and conversely, the more milk a cow gave, the more concentrates she was fed (Tables 13 and 14). Genetic potential and absolute level of feeding must be considered in examining this factor since increasing feed will not necessarily increase production infinitely. It is assumed that in these herds the genetic potential was greater than the feeding levels being practiced. Basic economic principles would say that a good dairy manager would aim to add more feed as long as it increases the dollar value of output by more than the cost of the feed.

Table 13. POUNDS OF CONCENTRATES FED PER COW AND RELATED FACTORS
366* New York Dairy Farms, 1978

Pounds of Concentrates Fed Per Cow	Percent of Farms	Average Number of Cows	Pounds Per Cow			Pounds Milk Sold Per Lb. of Concentrates	Labor & Mgt. Income/ Operator
			Concentrates	Milk Sold	Milk Produced		
4,000 or less	4	61	3,066	12,497	13,432	4.1	$14,093
4,001 to 5,000	22	58	4,567	12,812	13,696	2.8	14,538
5,001 to 6,000	28	65	5,547	14,266	15,081	2.6	21,634
6,001 to 7,000	26	73	6,408	14,977	15,965	2.3	24,217
7,001 to 8,000	14	73	7,463	15,125	16,327	2.0	17,567
8,001 & over	7	85	9,647	15,651	16,863	1.6	34,516

* Not available for four farms.

Dairymen commonly base their rate of concentrate feeding on the milk production. For the 1978 data, the ratio of concentrates fed per cow to the pounds of milk sold per cow was calculated for the six groups studied. The greater the amount of concentrates fed per cow the lower the ratio of milk to concentrates (Table 13). The farms feeding less than 4,000 pounds of concentrates per year had a ratio of 4.1, while those feeding over 8,000 pounds had a ratio of 1.6. In general, the farms with the lower milk to feed ratio also had higher labor and management incomes per operator. This suggests that feeding concentrates at a relatively high level was a profitable practice in 1978.

Table 14. OUTPUT MEASURES AND CONCENTRATES FED
366* New York Dairy Farms, 1978

Pounds Milk Sold Per Cow	Pounds Concentrates Fed Per Cow	Labor & Management Income Per Operator	Pounds Concentrates Fed Per Cow
Under 10,000	4,249	Minus (less than 0)	5,649
10,000 to 10,999	4,808	$ 1 to $ 9,999	5,525
11,000 to 11,999	5,266	$10,000 to $14,999	5,871
12,000 to 12,999	5,147	$15,000 to $19,999	6,155
13,000 to 13,999	5,797	$20,000 to $24,999	6,093
14,000 to 14,999	6,224	$25,000 to $29,999	6,231
15,000 to 15,999	6,504	$30,000 to $39,999	6,264
16,000 & over	6,943	$40,000 & over	6,286

* Not available for four farms.

To observe the relationship of concentrates fed per cow to the output measures, the farms were sorted on the basis of output factors. When the farms were grouped on the basis of pounds of milk sold per cow, the higher the rates of production, the greater the amount of concentrates fed (Table 14). The farms with 16,000 pounds or more milk sold per cow were feeding 63 percent more concentrates then those producing under 10,000 pounds per cow. The data in Table 14 are the counter examination of the relationship observed in Table 13 and is a further substantiation of the effects of rate of concentrates fed on the production per cow.

When the farms were sorted on the basis of labor and management income per operator, the pounds of concentrates fed tended to be greater on the farms with higher incomes. An exception to this was the farms with minus labor incomes and, as observed elsewhere, these tend to be larger farms that for some reason are inefficiently managed in the area of cost control and, therefore, experience losses. The spread in rates of concentrates fed per cow were not as great for the income sort as for the pounds of milk sold which is logical since more factors affect the income measure than the rate of production measure. In both cases, the output sorts further substantiate the findings of the sorts based on concentrates fed.

Table 15. POUNDS OF CONCENTRATES FED PER COW BY YEARS
New York Dairy Farms, 1974 through 1977

Pounds of Concentrates Fed Per cow	Percent of Farms				Lbs. of Milk Sold Per Lb. of Concentrates Fed			
	1974	1975	1976	1977	1974	1975	1976	1977
3,000 or less	7	6	3	1	4.5	4.6	4.7	4.2
3,001 to 4,000	17	13	9	10	3.3	3.4	3.4	3.2
4,001 to 5,000	36	33	27	22	2.8	2.9	2.9	2.9
5,001 to 6,000	27	29	30	31	2.5	2.5	2.5	2.6
6,001 & over	13	19	31	34	2.1	2.1	2.1	2.1

In 1974, only 13 percent of the farms were feeding over 6,000 pounds of concentrates per cow, but in 1977 this had increased to 34 percent of the farms (Table 15), and in 1978, to 47 percent (Table 13). At the lower rates of feeding, 24 percent of the farms were feeding less than 4,000 pounds per cow in 1974 but in 1977 only 11 percent were at this rate and in 1978 only four percent. This is a sizable shift and indicates the responsiveness of dairymen to changes in milk-feed price ratios.

Over the five years studied, the average pounds of concentrates fed per cow increased from 4,800 pounds in 1974, to 5,100 pounds in 1975, to 5,400 pounds in 1976, to 5,600 pounds in 1977, and 6,000 pounds in 1978. This increase in rate of concentrate feeding probably was due in part to the more favorable ratio of milk prices to feed costs as shown below:

Milk-Feed Price Ratios

Item	1974	1975	1976	1977	1978
Average milk price*	$8.38	$8.75	$9.83	$9.75	$10.50
Average cost of 16% dairy ration*	$6.91	$6.60	$6.95	$6.97	$6.83
Milk-feed price ratio	1.21	1.33	1.41	1.40	1.54

* Source: New York Agricultural Statistics 1978, Release 52.

The concentrate feeding rate in relation to milk produced is another factor examined (Table 15). Again this shows the changes that occurred in the four year period. The average pounds of concentrates fed by the high group (over 6,000) increased from 6,753 in 1974, to 6,848 in 1975, to 6,926 in 1976, 7,070 in 1977, and 7,205 in 1978. This suggests that the upper rates of feeding moved upward with more favorable milk-feed price ratios. The milk-feed ratios varied widely within each of the five years.

Table 16. POUNDS OF CONCENTRATES FED PER COW AND COSTS AND RETURNS
366* New York Dairy Farms, 1978

Pounds of Concentrates Fed Per Cow**	Feed Bought Per Cow	Income Over Feed Cost Per Cow
4,000 or less	$343	$ 977
4,001 to 5,000	377	882
5,001 to 6,000	432	965
6,001 to 7,000	422	1,024
7,001 to 8,000	463	1,028
8,001 & over	446	988

* Not available for four farms.
** Classes used differ from those in Table 17.

Table 17. POUNDS OF CONCENTRATES FED PER COW AND COSTS AND RETURNS
New York Dairy Farms, 1974 through 1977

Pounds of Concentrates Fed Per Cow	Feed Bought Per Cow				Income Over Feed Cost Per Cow			
	1974	1975	1976	1977	1974	1975	1976	1977
3,000 or less	$284	$274	$308	$248	$604	$599	$704	$733
3,001 to 4,000	282	301	318	314	618	663	804	729
4,001 to 5,000	320	306	342	380	693	684	837	800
5,001 to 6,000	381	343	402	401	702	729	890	848
6,001 & over	357	371	418	436	719	723	925	906

Pounds of concentrates fed per cow is a measure reported by the D.H.I. records, while cost of feed bought per cow is a measure from the farm business records. The feed bought per cow is affected by the quantities of home grown feed available and by relative prices paid which is often influenced some by quantity purchased. In general, the amount spent per cow for purchased feed was greater in 1978 than in 1974, a reflection of a combination of higher prices and heavier feeding (Tables 16 and 17). The average for all farms in 1974 was $335 but in 1978 it was $422.

Income over feed cost is a D.H.I. measure. This indicates the amount that the value of milk produced exceeds the calculated value of all feed fed. It is a computed value and is not the actual receipts or costs as reported in the farm business records. The income over feed cost for all five groups was considerably higher in 1978 than in 1974 and 1975. In all five years, in general, the income over feed cost per cow was greater for the farms feeding more concentrates per cow (Tables 16 and 17). In 1974 and 1975, the difference in income over feed cost between the high and low rates of feeding groups was about $100, while in 1976 and 1977 it was $200. In general, the spread widens as the milk-feed ratio increases.

Percent Net Energy From Concentrates, Succulents, and Dry Hay

The dairy production records include detailed information on the kinds and amounts of feed fed to the cows in the herd. The feeds fed provide the energy used by the cow for maintenance and production purposes. With the information obtained each month, it is practical with computer facilities to calculate a number of measures related to the feeding practices. Among these measures is the percent of net energy from each of the four kinds of feed used, namely, concentrates, succulents, dry hay, and pasture. The succulents include corn silage, haylage, green chop, and any other of the silage type of feeds.

Dairymen combine sources of feed in various ways to provide the energy needed by their cows. It would be possible to describe various feeding systems such as "all silage" or "hay and concentrates," and then classify the farms under these systems and study the effects of the system on income. For this study variations in the percent net energy provided by the four major sources was used as a basis for analysis.

For the 370 farms included in the 1978 study, the average of the sources of net energy were distributed as follows: concentrates 49 percent, succulents 32 percent, dry hay 12 percent, and pasture 7 percent. This indicates that roughages, which are usually grown on the farm, provided 51 percent or more than half of the net energy, while 49 percent was provided by concentrates, which may all have been purchased, or may have been part purchased and part from grains grown on the farm. The various combinations used would be many. A study of the farms growing various amounts of corn in 1978 is available in another publication.

Relationship between variations in the sources of net energy and the production per cow and the labor and management income per operator are reported below. It must be kept in mind that there are many other factors that are interrelated and also have an effect on the two output or result measures. This is an examination of simple direct relationships.

For 1978 only two percent of the farms reported that less than 35 percent of the net energy came from concentrates. Fifty-three percent, or more than one half of the farms were in the range of 45 to 54 percent of the net energy from concentrates (Table 18).

Table 18. PERCENT NET ENERGY FROM CONCENTRATES AND RELATED FACTORS
366* New York Dairy Farms, 1978

Percent Net Energy from Concentrates	Percent of Farms	Number of Cows	Pounds Milk Sold Per Cow	Labor & Management Income Per Operator
Under 30	1	67	12,697	$16,103
30 to 34	1	69	12,430	15,593
35 to 39	7	63	13,484	17,103
40 to 44	18	60	13,805	20,247
45 to 49	24	62	14,234	19,751
50 to 54	29	71	14,568	21,246
55 to 59	13	78	15,141	22,756
60 & over	7	83	14,772	26,308

* Not available for four farms.

In general, the higher the percent of net energy from concentrates the higher the average pounds of milk sold per cow. Also, the farms with more than half the net energy from concentrates were larger as measured by the number of cows. There appears to be a relationship between the percent of net energy from concentrates and labor and management income per operator with the more energy from concentrates the more milk per cow and the higher the labor income.

Table 19. PERCENT NET ENERGY FROM SUCCULENTS AND RELATED FACTORS
366* New York Dairy Farms, 1978

Percent Net Energy From Succulents	Percent of Farms	Number of Cows	Percent Net Energy From Concentrates	Pounds Milk Sold Per Cow	Labor & Management Income Per Operator
0	2	31	48	13,468	$ 4,084
1 to 4	**	**	**	**	**
5 to 9	2	40	54	13,745	17,297
10 to 19	10	49	53	13,976	17,276
20 to 29	27	55	49	14,398	19,706
30 to 39	31	67	50	14,607	21,719
40 to 49	22	91	47	14,480	24,139
50 & over	6	95	41	13,887	21,121

* Not available for four farms.
** Too few to report.

Interest in silage feeding has increased in recent years. The use of hay crops for silage purposes seems to be increasing. In the D.H.I. records, all silages are included under the classification of succulents. These accounted for 32 percent of the net energy for the 366 farms in the 1978 study but varied widely among the farms.

Two percent of the farms reported no succulents fed (Table 19). This would mean they depended on hay and pasture for roughage. These farms were smaller with an average of only 31 cows. At the other extreme, there were six percent of the farms that provided 50 percent or more of the net energy from succulents and they averaged 95 cows per farm.

In general, the farms that provided a higher percent of the net energy from succulents were larger as measured by number of cows. The percent of net energy from concentrates declined as the percent of net energy provided by succulents increased. The pounds of milk sold per cow tended to be higher from those with higher succulent rates. The labor and management income per operator in 1978 showed a tendency to be higher when a higher percent net energy was from succulents.

Table 20. PERCENT NET ENERGY FROM HAY AND RELATED FACTORS
366* New York Dairy Farms, 1978

Percent Net Energy From Hay	Percent of Farms	Number of Cows	Percent Net Energy From Concentrates	Pounds Milk Sold Per Cow	Labor & Management Income Per Operator
0	10	102	54	14,539	$23,824
1 to 4	13	105	51	14,496	27,805
5 to 9	24	67	50	14,699	21,159
10 to 14	16	57	50	14,363	21,409
15 to 19	18	57	47	14,111	19,580
20 & over	19	45	45	13,718	13,910

* Not available for four farms.

Ten percent of the 366 farms reported no net energy from dry hay (Table 20). On the other hand, there were 19 percent of the farms that provided 20 percent or more of the net energy from dry hay. The percent net energy from concentrates decreased as the percent from hay increased.

The farms with over 20 percent of net energy from hay sold less pounds of milk per cow. The farms with less than five percent net energy from hay had the highest average labor and management incomes per operator. The farms with a higher proportion of the net energy from hay were smaller as indicated by the average number of cows.

Another approach to the study of sources of net energy is to examine the farms on the basis of their rates of production and income and to determine what sources of energy they were using. The farms with the higher rates of production tended to have a higher percent of the net energy from concentrates.

Farms with less than 10,000 pounds of milk sold per cow obtained 45 percent of the net energy from concentrates, while those with 16,000 and over obtained 53 percent from concentrates. Farms with over 12,000 pounds of milk sold per cow obtained a higher percent of the net energy from succulents. The farms with higher rates of production depended less on hay and pasture for energy. The farms selling under 10,000 pounds per cow obtained 29 percent of the energy from hay and pasture, while the higher production herds only obtained 16 to 18 percent (Table 21).

Table 21. POUNDS OF MILK SOLD PER COW AND SOURCES OF ENERGY
366* New York Dairy Farms, 1978

Pounds Milk Sold Per Cow	Percent Net Energy			
	Concentrates	Succulents	Hay	Pasture
Under 10,000	45	26	18	11
10,000 to 10,999	48	27	16	10
11,000 to 11,999	47	28	15	11
12,000 to 12,999	46	31	14	10
13,000 to 13,999	48	34	12	6
14,000 to 14,999	49	35	10	6
15,000 to 15,999	50	32	11	6
16,000 & over	53	31	11	6

* Not available for four farms.

When sorted on the basis of labor and management income per operator, there appears to be a relationship with the sources of energy. The farms with higher labor and management incomes obtained a larger proportion of the net energy from concentrates and succulents and a lower proportion from hay and pasture than the lower income farms (Table 22).

Table 22. LABOR AND MANAGEMENT INCOME AND SOURCES OF ENERGY
366* New York Dairy Farms, 1978

Labor & Management Income Per Operator	Percent Net Energy			
	Concentrates	Succulents	Hay	Pasture
Minus (less than 0)	47	31	15	7
$ 0 to $ 9,999	48	30	14	9
$10,000 to $14,999	48	29	14	9
$15,000 to $19,999	50	32	12	6
$20,000 to $24,999	50	32	11	7
$25,000 to $29,999	50	33	10	7
$30,000 to $39,999	49	33	12	6
$40,000 & over	49	37	8	6

* Not available for four farms.

Average Body Weight of All Cows

The average body weight of all cows in 1976 had a Pearson correlation of .51 to milk produced per cow (A.E. Res.77-20). In 1978 the larger the cow the more milk she gave. Labor and management income also increased as the average body weight for all cows in the herd increased. In general for 1978, farms with larger cows fed more pounds of concentrate per cow, sold more pounds of milk per cow, and had larger labor and management incomes per operator (Table 23).

Table 23. AVERAGE BODY WEIGHT OF ALL COWS AND RELATED FACTORS
370 New York Dairy Farms, 1978

Average Body Weight All Cows	Percent of Farms	Number of Cows	Average B.F. Test	Pounds Milk Sold Per Cow	Pounds of Concentrates Fed Per Cow	Labor & Mgt. Income Per Operator
1,150 or less	7	60	3.99	12,012	5,006	$17,266
1,151 to 1,200	18	64	3.63	13,978	5,728	18,803
1,201 to 1,250	27	65	3.62	14,232	6,002	19,420
1,251 to 1,300	24	77	3.65	14,823	6,193	20,842
1,301 & over	24	68	3.70	14,985	6,343	25,346

The average body weight of all cows on the 370 farms in 1978 was 1,250 pounds. More than half of the farms were in the 1,200 to 1,300 pound group (Table 23). The seven percent of the farms, which had an average body weight of all cows of 1,150 pounds or less, had an average butterfat test of 3.99 indicating that some non-Holstein herds were in this group. For other groups, average test of 3.62 to 3.70 would suggest that most of them were Holstein herds. It is also significant to note that the average herd size was larger for the groups with larger cows.

Pounds of milk sold per cow increased as the size of the cows increased. The 24 percent of the farms with average body weights of over 1,300 pounds sold 3,000 pounds more milk per cow than the seven percent of the farms with average body weights of 1,150 or less pounds. The larger cows also were fed more concentrates than the smaller cows.

Labor and management income per operator increased as the average size of the cows increased. The farms with 1,300 pounds and over body weights had 50 percent higher average labor and management incomes than the farms with body weights of less than 1,150 pounds ($25,346 vs. $17,266).

When the farms were sorted on the basis of pounds of milk sold per cow, the average body weight of all cows tended to increase as the pounds of milk sold per cow increased (Table 24). This is a further examination of the body weight and rate of production relationship discussed above.

The sort by labor and management income when related to body weights of the herd showed a tendency for the better income farms to have larger cows.

Body weight reflects genetic potential and age as well as feeding level. A larger cow gives more milk because she has more body resources to make milk. However, the efficiency of feed conversion to milk is important as well. The average income figures would suggest that not only did the larger cows give more milk but they did it more profitably. A generalization might be that the larger cows did pay better. The same relationships existed for the 1974, 1975, 1976, and 1977 data.

Table 24. OUTPUT MEASURES AND AVERAGE BODY WEIGHT ALL COWS
370 New York Dairy Farms, 1978

Pounds Milk Sold Per Cow	Average Body Weight All Cows	Labor & Management Income Per Operator	Average Body Weight All Cows
Under 10,000	1,080	Minus (less than 0)	1,250
10,000 to 10,999	1,160	$ 0 to $ 9,999	1,250
11,000 to 11,999	1,220	$10,000 to $14,999	1,230
12,000 to 12,999	1,240	$15,000 to $19,999	1,240
13,000 to 13,999	1,250	$20,000 to $24,999	1,260
14,000 to 14,999	1,270	$25,000 to $29,999	1,260
15,000 to 15,999	1,270	$30,000 to $39,999	1,290
16,000 & over	1,290	$40,000 & over	1,270

Body Weight at First Calving

Body weight at first calving might logically be considered under practices other than feeding. Breeding practices certainly have some effect on weight at first calving. The measure is examined under the feeding section recognizing that feeding is an important factor affecting size.

Body weight at first calving in 1976 had a Pearson correlation of .64 with the average body weight of all cows in the herd. This suggests that the weight of all animals in some herds tended to be heavier due to genetic differences, feeding and breeding practices of the dairymen. Body weight at first calving also had a Pearson correlation of .35 to the age at first calving. This is logical since the animal had longer to put on weight. The cross tabulation analysis for 1978 is shown in Tables 25 and 26.

Table 25. BODY WEIGHT AT FIRST CALVING AND RELATED FACTORS
370 New York Dairy Farms, 1978

Body Weight at First Calving	Percent of Farms	Number of Cows	Pounds Milk Sold Per Cow	Pounds of Concentrates Fed Per Cow	Labor & Mgt. Income Per Operator
1,020 or less	11	60	12,833	5,436	$16,947
1,030 to 1,040	5	59	13,988	5,641	22,494
1,050 to 1,060	5	63	14,133	5,214	13,535
1,070 to 1,090	9	67	14,013	6,237	18,917
1,100 to 1,110	11	70	14,337	6,030	22,828
1,120 to 1,130	16	82	14,517	6,143	21,139
1,140 & over	42	67	14,721	6,194	22,645

Eleven percent of the farms had an average weight at first calving of 1,020 or less pounds. On the other hand, 42 percent of the farms reported weights of 1,140 or over pounds at first calving (Table 25).

In examining the factors for the various size groups at first calving, there seems to be a direct relationship to size of herd. There also was a direct relationship between weight at first calving and production per cow. Herds with larger heifers at first calving also had higher herd production averages.

Farms with larger heifers at freshening also fed more concentrates per cow. This probably indicates that dairymen who feed more concentrates to their cows also feed more to the heifers and consequently grow them to a larger size by freshening time. There appeared to be some relationship of weight at first calving and labor and management income per operator.

Table 26. OUTPUT MEASURES AND BODY WEIGHT AT FIRST CALVING
370 New York Dairy Farms, 1978

Pounds Milk Sold Per Cow	Body Weight at First Calving	Labor & Management Income Per Operator	Body Weight at First Calving
Under 10,000	960	Minus (less than 0)	1,100
10,000 to 10,999	1,050	$ 0 to $ 9,999	1,090
11,000 to 11,999	1,090	$10,000 to $14,999	1,080
12,000 to 12,999	1,080	$15,000 to $19,999	1,100
13,000 to 13,999	1,090	$20,000 to $24,999	1,110
14,000 to 14,999	1,120	$25,000 to $29,999	1,110
15,000 to 15,999	1,120	$30,000 to $39,999	1,140
16,000 & over	1,130	$40,000 & over	1,110

When the farms were sorted on the basis of milk sold per cow, there was a definite relationship with the body weight at first calving. The farms with less than 10,000 pounds of milk sold per cow had an average first calving weight of 960 pounds compared with 1,130 pounds for herds selling 16,000 or over pounds of milk per cow (Table 26). The sort by labor and management income per operator was somewhat variable but those with better incomes tended to have larger first calf heifers.

Analysis of Breeding Practices

The dairy management practices included in this section are: age at first calving, projected minimum calving interval, breedings per conception, average number of days dry, and percent of days in milk.

Age at First Calving

The correlation coefficients between the output measures and age at first calving in 1976 were negative indicating an inverse relationship (A.E. Res. 77-20). As age at first calving increases, the body weight at calving increased but the milk sold per cow tended to decrease and the labor and management income per operator showed little variation.

Table 27. AGE AT FIRST CALVING AND RELATED FACTORS
370 New York Dairy Farms, 1978

Age at First Calving	Percent of Farms	Number of Cows	Body Weight at First Calving	Pounds Milk Sold Per Cow	Labor & Management Income Per Operator
Under 27	24	72	1,090	14,614	$22,127
27 to 28	24	68	1,100	14,769	19,271
29 to 30	23	70	1,110	14,400	20,744
31 to 32	13	62	1,130	13,811	20,625
33 & over	16	65	1,100	13,783	22,790

The average age at first calving for the 370 farms in 1978 was 29 months. There was a sizable range among the farms. Twenty-four percent or nearly one-fourth had average age at first calving of less than 27 months. These are in line with the recommendations of aiming to have heifers calve at two years of age. At the other end of the range, 16 percent reported average age at first calving of 33 months or more which is approaching three years of age.

The farms with the younger calving age for heifers had the larger herd size and the higher production per cow. The group with the largest labor and management income per operator averaged 33 and over months at first calving.

Table 28. OUTPUT MEASURES AND AGE AT FIRST CALVING
370 New York Dairy Farms, 1978

Pounds Milk Sold Per Cow	Age at First Calving	Labor & Management Income Per Operator	Age at First Calving
Under 10,000	27	Minus (less than 0)	28
10,000 to 10,999	33	$ 0 to $ 9,999	29
11,000 to 11,999	30	$10,000 to $14,999	29
12,000 to 12,999	31	$15,000 to $19,999	29
13,000 to 13,999	29	$20,000 to $24,999	29
14,000 to 14,999	29	$25,000 to $29,999	29
15,000 to 15,999	29	$30,000 to $39,999	30
16,000 & over	28	$40,000 & over	29

The farms were sorted on pounds of milk sold per cow and then the average age at first calving was computed. In general, the higher the herd production average, the lower was the average age at freshening (Table 28). An exception is the group selling less than 10,000 pounds per cow which averaged 27 months at freshening. From previous tables, it was observed that this group included more high test herds which tend to have lower production averages.

The sort on the basis of labor and management income per operator showed relatively little differences in average age at first calving.

Body weight at first calving had a stronger correlation with milk per cow than age at first calving which helps to disguise the effects of earlier calving. It makes management sense that the sooner a heifer freshens, the more income one will derive due to savings from not carrying a nonproducing animal. One must maintain high levels of feeding, however, as this young cow will still be growing while milking.

Projected Minimum Calving Interval

The average minimum calving interval for the 370 farms in 1978 was 12.9 months. For the years 1974 to 1975, the minimum calving interval was 13.0 months. This means that the average farmer is settling his cows about the fourth month after freshening.

Eighteen percent of the farms had an average minimum calving interval of less than 12.5 months (Table 29). This indicates that some dairymen are successful in getting their herd bred back within 100 days after freshening. It must be kept in mind, that these are averages for the herd so if a farmer has some cows that are hard to settle it is easy to raise the herd's average interval even though many cows in the herd may have been bred back on time.

Table 29. PROJECTED MINIMUM CALVING INTERVAL AND RELATED FACTORS
370 New York Dairy Farms, 1978

Projected Minimum Calving Interval (Months)	Percent of Farms	Number of Cows	Pounds Milk Sold Per Cow	Labor & Mgt. Income Per Operator
Less than 12.5	18	58	14,147	$19,498
12.5 to 12.9	32	68	14,488	20,616
13.0 to 13.4	31	68	14,547	21,041
13.5 to 13.9	13	85	14,186	24,118
14.0 or more	6	62	14,150	21,463

In theory one would expect that the shorter the calving interval, the greater the amount of milk per cow and in turn the larger the income per operator. However, from these data for 1978 the calving interval does not show these kinds of relationships (Table 29). The economics of this management practice needs further examination.

Table 30. OUTPUT MEASURES AND PROJECTED MINIMUM CALVING INTERVAL
370 New York Dairy Farms, 1978

Pounds Milk Sold Per Cow	Projected Minimum Calving Interval	Labor & Management Income Per Operator	Projected Minimum Calving Interval
Under 10,000	13.4	Minus (less than 0)	13.0
10,000 to 10,999	13.0	$ 0 to $ 9,999	12.9
11,000 to 11,999	12.3	$10,000 to $14,999	12.8
12,000 to 12,999	13.2	$15,000 to $19,999	13.0
13,000 to 13,999	13.0	$20,000 to $24,999	12.9
14,000 to 14,999	12.7	$25,000 to $29,999	13.0
15,000 to 15,999	12.9	$30,000 to $39,999	13.1
16,000 & over	13.0	$40,000 & over	12.8

When sorted by the output measures, there was no observable trend in minimum calving interval with the pounds of milk sold per cow or labor and management income per operator.

One way to decrease the calving interval is to decrease the breedings per conception by effective heat detection, by good gynecological care, and by feeding enough net energy. Another factor is how soon the dairyman aims to breed back after freshening.

Breedings Per Conception

The relationship of breedings per conception to labor and management income as shown in Table 31 is not what one might logically expect. Fewer breedings per conception did not give a higher income per operator. The pounds of milk sold per cow showed no relationship to the number of breedings per conception. This may be due to the fact that higher producing cows tend to be harder to settle.

Table 31. BREEDINGS PER CONCEPTION AND RELATED FACTORS
370 New York Dairy Farms, 1978

Breedings Per Conception	Percent of Farms	Number of Cows	Pounds Milk Sold Per Cow	Veterinary Expenses Per Cow	Labor & Mgt. Income Per Operator
1.4 or less	25	62	13,976	$24.82	$21,066
1.5 to 1.6	25	70	14,454	24.33	19,264
1.7 to 1.8	19	68	14,418	31.13	21,950
1.9 to 2.0	12	77	14,421	27.86	25,344
Over 2.0	19	69	14,459	34.81	19,524

Twenty-five percent of the farms reported an average of less than 1.5 breedings per conception in 1978. Nineteen percent or one out of about five reported an average of over 2.0. The average of all 370 farms was 1.7 breedings per conception. The veterinary expenses per cow increased as the number of breedings increased with the highest of $34.81 for the group with more than 2.0 breedings per conception (Table 31).

Table 32. OUTPUT MEASURES AND BREEDINGS PER CONCEPTION
370 New York Dairy Farms, 1978

Pounds Milk Sold Per Cow	Breedings Per Conception	Labor & Management Income Per Operator	Breedings Per Conception
Under 10,000	2.0	Minus (less than 0)	1.8
10,000 to 10,999	1.7	$ 0 to $ 9,999	1.7
11,000 to 11,999	1.6	$10,000 to $14,999	1.7
12,000 to 12,999	1.7	$15,000 to $19,999	1.8
13,000 to 13,999	1.6	$20,000 to $24,999	1.7
14,000 to 14,999	1.8	$25,000 to $29,999	1.7
15,000 to 15,999	1.8	$30,000 to $39,999	1.7
16,000 & over	1.7	$40,000 & over	1.7

When sorted on the basis of milk sold per cow, there was no difference in the number of breedings per conception (Table 32). This is in line with the sort on the basis of breedings per conception. There was some indication that the breedings per conception were somewhat lower for the higher income groups.

Average Number of Days Dry

Once it was thought that a longer resting period between lactations allowed the cow to build up energy reserves which would be returned later in the form of more milk per cow. Recently, however, it has been shown that with higher levels of concentrate feeding and proper veterinary care, milk per cow and labor and management income per operator increased with fewer days dry.

Table 33. AVERAGE DAYS DRY AND RELATED FACTORS
370 New York Dairy Farms, 1978

Average Days Dry	Percent of Farms	Number of Cows	Milk Sold Per Cow	Labor & Management Income/Operator
50 or less	11	73	14,148	$17,510
51 to 55	15	79	15,170	25,753
56 to 60	22	72	14,321	22,020
61 to 65	26	67	14,442	20,922
66 to 70	13	59	13,956	18,376
Over 70	13	56	13,395	18,200

Eleven percent of the farms reported an average of 50 or less days dry (Table 33). Forty-eight percent or nearly one-half of the farms reported 60 days or less, which is less than two months time out of production. It is of interest to observe that the farms with the lower number of days dry were the larger herds.

Farms with fewer days dry had higher production rates as shown by the pounds of milk sold per cow. This is to be expected since they are producing more days of the year. Likewise, the farms with the fewer days dry tended to have higher labor and management incomes (Table 33). It appears to pay to keep the average days dry to 60 days or less.

Farmers with higher incomes and the higher rates of production in 1978 and fewer days dry per cow (Table 34). This is in line with the observations based on days dry and output shown in Table 33.

Table 34. OUTPUT MEASURES AND DAYS DRY
370 New York Dairy Farms, 1978

Pounds Milk Sold Per Cow	Days Dry	Labor & Management Income Per Operator	Days Dry
Under 10,000	65	Minus (less than 0)	61
10,000 to 10,999	65	$ 0 to $ 9,999	60
11,000 to 11,999	70	$10,000 to $14,999	64
12,000 to 12,999	62	$15,000 to $19,999	60
13,000 to 13,999	60	$20,000 to $24,999	63
14,000 to 14,999	59	$25,000 to $29,999	59
15,000 to 15,999	60	$30,000 to $39,999	58
16,000 & over	57	$40,000 & over	58

Percent of Days in Milk

The percent of days in milk is an aggregate measure of calving interval, days dry, and days open. In general, the higher percent of days in milk, the more milk per cow and the more labor and management income per operator (Table 35).

Table 35. PERCENT OF DAYS IN MILK AND RELATED FACTORS
370 New York Dairy Farms, 1978

Percent of Days In Milk	Percent of Farms	Number of Cows	Pounds Milk Sold Per Cow	Days Dry	Calving Interval	Labor & Mgt. Income Per Operator
80 or less	3	37	12,465	92	12.9	$ 8,633
81 to 83	11	57	13,098	68	12.4	17,354
84 to 86	36	68	14,260	64	12.8	19,785
87 to 89	42	72	14,783	56	13.0	24,087
Over 90	8	74	14,449	49	13.3	17,982

Most farms were in the 84 to 89 percent of days in milk categories. Farms with the higher percent of days in milk tended to be larger as measured by number of cows. As the percent of days in milk increased, the average days dry decreased.

Table 36. OUTPUT MEASURES AND PERCENT OF DAYS IN MILK
370 New York Dairy Farms, 1978

Pounds Milk Sold Per Cow	Percent of Days in Milk	Labor & Management Income Per Operator	Percent of Days in Milk
Under 10,000	87	Minus (less than 0)	86
10,000 to 10,999	85	$ 0 to $ 9,999	86
11,000 to 11,999	84	$10,000 to $14,999	86
12,000 to 12,999	86	$15,000 to $19,999	87
13,000 to 13,999	86	$20,000 to $24,999	86
14,000 to 14,999	87	$25,000 to $29,999	86
15,000 to 15,999	87	$30,000 to $39,999	87
16,000 & over	87	$40,000 & over	87

When the farms were sorted on the basis of milk sold per cow and labor and management income per operator, there was some observable relationship to percent of days in milk (Table 36). The relationship was more evident in the pounds of milk sold per cow sort than in the sort on income.

Analysis of Culling Practices

Choosing which cows to keep, which to sell, and when, is an important but difficult management decision. To examine culling practices, two measures were used; percent of cows leaving the herd for purposes other than dairy (slaughter), and average age of all cows. Over the five years, the tendency was to cull more heavily.

Percent Leaving the Herd

In 1974, the average percent leaving the herd was 23, in 1975 it was 27, in 1976 it was 28, in 1977 it was 29, and in 1978 it was 30.

Table 37. PERCENT LEAVING THE HERD AND RELATED FACTORS
370 New York Dairy Farms, 1978

Percent Leaving Herd	Percent of Farms	Number of Cows	Pounds Milk Sold Per Cow	Labor & Mgt. Income Per Operator
Under 20	13	57	14,288	$23,195
20 to 24	17	64	14,445	23,553
25 to 29	21	74	14,354	20,252
30 to 34	20	69	14,413	18,629
Over 35	29	70	14,439	21,044

A specific percent of cull is not obvious from these data. It is likely that there is a "too high" and a "too low" level for culling, with the optimum incomewise in the range of twenty to twenty-five percent. This would mean keeping the cows at an average of about four lactations. Dairy herd improvement recommends not keeping a cow that does not perform well on her first lactation in the hopes the second will be better. Some animals are culled during or at the end of the first lactation. To counter balance these early culls, some cows are kept much longer than the average of four lactations. The averages used here give an overall indication of what is happening to the herd as a whole due to the culling practices.

There was no observable difference in the pounds of milk sold per cow when the farms were sorted on the basis of percent of cows leaving the herd. The herds with culling rates of under 25 percent were somewhat smaller as measured by number of cows (Table 37).

Table 38. OUTPUT MEASURES AND PERCENT LEAVING THE HERD
370 New York Dairy Farms, 1978

Pounds Milk Sold Per Cow	Percent Leaving Herd	Labor & Management Income Per Operator	Percent Leaving Herd
Under 10,000	37	Minus (less than 0)	33
10,000 to 10,999	30	$ 0 to $ 9,999	31
11,000 to 11,999	32	$10,000 to $14,999	29
12,000 to 12,999	28	$15,000 to $19,999	31
13,000 to 13,999	29	$20,000 to $24,999	31
14,000 to 14,999	30	$25,000 to $29,999	27
15,000 to 15,999	30	$30,000 to $39,999	28
16,000 & over	31	$40,000 & over	31

When sorted by labor and management income per operator and milk sold per cow, all averages fell in the 28 to 37 percent culling range. Farms with the top production averages culled about 30 percent during the year. Individual farmers should consider each cow's performance in relation to the rest of the herd and cull accordingly.

Further data would be helpful to eliminate farmers who are expanding or contracting their herd size, which affects their culling rate.*

* For a more detailed analysis of cow turnover or culling, see Cornell A.E. Res. 77-19 by Clark and Bratton.

Average Age of All Cows

It might logically be expected that the herds with a higher average age would have a higher labor and management income per operator since the costs of replacements either in raising heifers or by purchases would be less. However, this was not true for the 370 herds studied for 1978. A similar situation existed in the earlier years studied.

Table 39. AVERAGE AGE AND RELATED FACTORS
370 New York Dairy Farms, 1978

Average Age	Percent of Farms	Number of Cows	Pounds Milk Sold Per Cow	Labor & Mgt. Income Per Operator
Under 45	7	88	14,597	$33,964
45 to 49	20	79	14,743	18,459
50 to 54	30	68	14,344	20,128
55 to 59	24	59	14,624	20,616
Over 60	19	60	13,848	21,078

Nearly half of the farms had a herd average age of 55 months or over. However, the farms in the under 45 months average age group had the best labor and management income per operator. There was some variation in the pounds of milk sold per cow and the average age of the herd. The farms with an average age of cows in the herd of over 60 months had the lowest rate of production.

A possible explanation of younger herds producing more than older herds, could be an adherence to the DHI recommendation of culling cows whose production is not up to expectations in the first year. Also, each year the genetic potential of the new cows should be somewhat better due to the improved sires being used by artificial inseminators.

Table 40. OUTPUT MEASURES AND AVERAGE AGE
370 New York Dairy Farms, 1978

Pounds Milk Sold Per Cow	Average Age	Labor & Management Income Per Operator	Average Age
Under 10,000	52	Minus (less than 0)	52
10,000 to 10,999	57	$ 0 to $ 9,999	55
11,000 to 11,999	55	$10,000 to $14,999	55
12,000 to 12,999	57	$15,000 to $19,999	54
13,000 to 13,999	54	$20,000 to $24,999	54
14,000 to 14,999	53	$25,000 to $29,999	53
15,000 to 15,999	53	$30,000 to $39,999	52
16,000 & over	51	$40,000 & over	52

When sorted on the basis of pounds of milk sold per cow, the herds with the higher rates of production had lower average ages or, in brief, were younger herds. Likewise, the higher the labor and management income, the lower the average age of the cows in the herd. This suggests that heavier culling and younger herds in general produced better and paid better. This is counter to what is usually expected and further study of this situation would appear to be in order.

Trends in Management Practices

Dairy farming has experienced many changes over time. New technology based on research findings gives rise to changes in practices followed. Information from the farm business management and dairy herd improvement records is useful in identifying trends that are taking place. These appear in the data for the five years included in this study.

Changes in Farm Business Factors

The farms included in this study during the five years from 1974 to 1978 showed a slight decrease in physical size as measured by man equivalent, number of cows, and total acres in crops but a small increase in total pounds of milk sold. Due to rising prices total cash receipts and total end inventory values increased considerably.

An increase in total milk produced was achieved with fewer cows but higher producing cows. Milk production per cow from 1974 to 1978 increased 11 percent or about two percent per year. This resulted in more milk sold per man but with two less cows per man. Also, with price changes a smaller percentage of the milk receipts went for purchased feed in 1978 than in 1974 (Table 41).

Changes in Dairy Management Practices

An examination of the dairy management practices gives some indication of how the increase in production per cow was obtained. Pounds of concentrates fed per cow increased by 25 percent from 1974 to 1978. The percent net energy from concentrates increased from 43 to 49 percent with a decrease from 23 to 19 in the percent net energy from hay and pasture (Table 42).

Projected minimum calving interval and average days dry decreased which is considered to be an improvement. Culling rates were higher in 1978 than 1974 and the average age of all cows was lower. There was no change in breedings per conception and age at first calving.

The most outstanding changes during this five year period were in dairy feeding and herd management practices. Little change was shown in the basic management factors other than production rates. It is suggested that the increased concentrate feeding rates may have resulted from the economics of milk and feed price ratios. The average milk-feed price ratio increased from 1.21 in 1974 to 1.54 in 1978. A detailed study of the effects of the milk-feed price ratio on production and labor income is in progress.

Changes in the major factors studied for each of the five years are shown in Table 45 in the Appendix.

Table 41. CHANGES IN FARM BUSINESS FACTORS 1974 to 1978
New York Dairy Farms with DHI and Farm Business Records

Farm Business Factors	Average Reported in 1974	Average Reported in 1978	Percent Change
Size:			
Man equivalent	2.5	2.4	- 4
Number of cows	74	68	- 8
Number of heifers	54	49	- 9
Total crop acres	217	213	- 2
Total lbs. milk sold	955,000	979,000	+ 3
Total capital farm receipts	$91,800	$119,100	+30
Total end inventory	$240,000	$313,000	+30
Production Rates:			
Milk produced per cow	13,700	15,200	+11
Milk sold per cow	12,900	14,400	+12
Tons corn silage per acre	13.6	14.1	+ 4
Labor Efficiency:			
Cows per man equivalent	30	28	- 7
Milk sold per man equivalent	382,000	405,000	+ 6
Prices and Costs:			
Average price received for milk	$8.01	$10.48	+31
Feed purchased per cow	$335	$422	+26
Percent feed is of milk receipts	30%	28%	- 7

Table 42. CHANGES IN DAIRY MANAGEMENT PRACTICES 1974 to 1978
New York Dairy Farms with DHI and Farm Business Records

Dairy Management Practice	Average Reported in 1974	Average Reported in 1978	Percent Change
Production Records:			
Percent farms with DHI	76%	88%	+16
Percent farms with owner sampler	24%	12%	-50
Feeding:			
Rate of roughage feeding	2.4	2.3	- 4
Lbs. concentrates per cow	4,800	6,000	+25
Percent net energy from:			
Concentrates	43%	49%	+14
Succulents	33%	32%	- 3
Hay	14%	12%	-14
Pasture	9%	7%	-22
Breeding:			
Projected minimum calving interval	13.0	12.9	- 1
Days dry	64	61	- 5
Breedings per conception	1.7	1.7	0
Age at first calving	29	29	0
Other:			
Percent leaving herd as culls	23%	30%	+30
Average age all cows (months)	56	54	- 4
Income over value feed	$681	$972	+43

Summary and Conclusions

The purpose of this project was to study the relation of selected dairy management practices to farm business management factors. Data on 13 dairy herd improvement management practices were merged with farm business summary data for more than 300 farms for each of five years. Cross tabulation analyses were made for the thirteen factors, and a Pearson correlation analysis was performed on the 1976 records. These analyses add a new dimension to the dairy farm management business summaries and show how these dairy management practices pay on typical commercial New York dairy farms.

Pounds of milk sold per cow and labor and management income per operator were used as indicators of the effects of the dairy management practices. The first measured the physical output, and the second the financial return from the farm business. Other factors such as size and costs were studied to observe interrelationships among the factors.

Effects of the dairy management practices were more apparent on the pounds of milk sold per cow than on the labor and management income per operator. This is logical since the first effect of the use of a dairy practice is on the milk production of the cow, which in turn will affect the income. Labor income measures the combined effects of the many components of the business. Cost control features apply to all production practices so are more far reaching in effects than just the physical measures. One can increase production by the use of a practice but possibly reduce the income if the added costs exceed the added dollar returns.

The cross tabulations for the various dairy management practices indicate that the practices do affect rates of production and the operator's income. The practices that showed the most relationship to labor and management income per operator were: pounds of concentrate fed per cow, percent of net energy from succulents, and average age of all cows. The practices showing the greatest effect on milk sold per cow were: pounds of concentrates fed, average body weight of all cows, average body weight at first calving, average age of all cows, and average number of days dry. These were substantiated by the Pearson correlation analysis made for the 1976 records.

In summary, the 13 dairy management practices reported in the DHI records did have an effect on the labor and management incomes of the dairy farm operators. Some practices appeared to have greater effects than others. During the five years there was a noticeable improvement in dairy management practices which increased the pounds of milk sold per cow and per man, and in turn improved the labor and management income per operator.

Appendix Tables

Table 43. FEEDING INDEX AND RELATED FACTORS
366* New York Dairy Farms, 1978

Feeding Index	Percent of Farms	Number of Cows	Pounds Milk Sold Per Cow	Pounds of Concentrate Fed Per Cow	Labor & Mgt. Income Per Operator
Less than 100	4	70	14,761	4,107	$22,562
100 to 104	4	84	14,086	4,703	25,771
105 to 109	7	65	14,751	5,376	18,430
110 to 114	15	56	14,430	5,713	15,572
115 to 119	20	65	14,495	5,883	21,554
120 to 124	21	67	14,484	6,046	19,746
125 & over	29	74	14,205	6,872	24,255

* Not available for four farms.

There was no apparent relationship between feeding index and pounds of milk sold per cow or in labor and management income per operator. The pounds of concentrates fed per cow did show a positive relationship to the feeding index.

Table 44. INCOME OVER FEED COST AND RELATED FACTORS
366* New York Dairy Farms, 1978

Income Over Feed Cost	Percent of Farms	Number of Cows	Pounds Milk Sold Per Cow	Pounds of Concentrate Fed Per Cow	Labor & Mgt. Income Per Operator
Less than $800	16	61	12,233	5,673	$15,159
$ 800 to $ 849	8	69	13,438	6,128	19,076
$ 850 to $ 899	11	65	13,589	5,629	19,175
$ 900 to $ 949	11	66	14,214	5,882	18,010
$ 950 to $ 999	13	69	14,604	6,070	24,987
$1,000 to $1,049	9	84	14,780	6,162	22,254
$1,050 to $1,099	9	64	15,391	6,117	19,395
$1,100 & over	23	68	15,871	6,291	25,052

* Not available for four farms.

Income over feed cost was directly related to pounds of milk sold per cow and pounds of concentrates fed per cow but had no consistent relationship to labor and management income per operator. This suggests that there are factors other than milk production and feed costs which have a strong influence on the profitability of the farm business.

Table 45. AVERAGE OF SELECTED FACTORS FOR ALL FARMS IN STUDY
New York Dairy Farms, 1974 through 1978

Factor	Average of All Farms				
	1974	1975	1976	1977	1978
Number of farms	413	380	337	363	370
% farms with DHI records	76%	76%	81%	84%	88%
% farms owner-sampler	24%	23%	19%	16%	12%
% farms free stall barns	32%	35%	32%	35%	32%
Man equivalent	2.5	2.5	2.5	2.4	2.4
Number of cows	74	74	70	69	68
Number of heifers	54	58	54	51	49
Total crop acres	217	220	206	211	213
Total lbs. milk sold	954,900	995,800	958,600	971,700	979,300
Total cash farm receipts	$91,782	$95,230	$104,571	$105,102	$119,119
Total end inventory	$240,000	$259,000	$265,000	$283,000	$313,000
Milk produced per cow	13,700	14,200	14,500	14,800	15,200
Milk sold per cow	12,900	13,500	13,700	14,100	14,400
Tons hay equivalent per acre	2.7	2.7	2.9	2.4	2.5
Tons corn silage per acre	13.6	14.2	13.2	14.3	14.1
Cows per person	30	30	28	29	28
Milk sold per person	382,000	398,000	383,000	402,000	405,000
Feed purchased per cow	$335	$329	$381	$402	$422
% feed is of milk receipts	30%	28%	28%	29%	28%
Feeding index	119	119	120	119	120
Rate roughage feeding	2.4	2.4	2.4	2.3	2.3
Lbs. concentrates fed per cow	4,800	5,100	5,400	5,600	6,000
% net energy from concentrates	43%	45%	47%	48%	49%
% net energy from succulents	33%	34%	32%	32%	32%
% net energy from hay	14%	12%	12%	13%	12%
% net energy from pasture	9%	9%	9%	8%	7%
Projected calving interval (mo.)	13.0	13.0	12.9	12.9	12.9
Days dry	64	64	61	62	61
% days in milk	86%	86%	86%	86%	86%
Breedings per conception	1.7	1.7	1.7	1.7	1.7
% leaving herd	23%	27%	28%	29%	30%
Age at first calving (mo.)	29	29	29	29	29
Age all cows (mo.)	56	55	55	54	54
Body weight at first calving	1,070	1,070	1,070	1,080	1,100
Body weight all cows	1,240	1,240	1,240	1,240	1,250
Income over value feed	$681	$698	$874	$843	$972
Average price received for milk	$8.61	$8.65	$9.91	$9.75	$10.48
Labor & mgt. income per operator	$5,032	$3,946	$8,080	$3,178	$20,980

Table 46. SELECTED BUSINESS FACTORS BY SIZE OF LABOR AND MANAGEMENT INCOME PER OPERATOR
370 New York Dairy Farms, 1978

Factor	Labor and Management Income Per Operator							
	Less Than 0	0 to $ 9,999	$ 10,000 to $ 14,999	$ 15,000 to $ 19,999	$ 20,000 to $ 24,999	$ 25,000 to $ 29,999	$ 30,000 to $ 39,999	More Than $ 40,000
Number of farms	27	52	62	51	49	40	38	51
% of farms	7%	14%	16%	13%	13%	10%	10%	13%
Labor & Mgt. Income/Oper.	$-9,423	$6,145	$12,643	$17,343	$22,156	$27,431	$33,877	$56,336
Barn Type								
% with free stalls	22%	17%	22%	27%	28%	45%	34%	60%
Size of Business								
Man equivalent	2.7	2.0	2.3	2.3	2.3	2.5	2.7	3.3
Total crop acres	203	163	183	207	192	215	262	296
Number of cows	61	53	58	62	63	71	79	101
Total capital	$349,577	$255,034	$261,137	$288,724	$286,554	$308,938	$344,217	$443,347
Rates of Production								
Lbs. milk sold/cow	13,838	13,760	13,979	14,381	14,273	14,720	14,624	14,774
Tons hay crops/ac. (H.E.)	2.8	2.6	2.4	2.4	2.3	2.6	2.6	2.6
Tons corn silage/ac.	13.3	14.1	14.0	13.5	14.6	14.9	13.4	14.6
Labor Efficiency								
Lbs. milk sold/man	316,142	364,650	360,356	396,267	399,644	418,040	432,697	459,138
Cows/man	23	27	26	28	28	28	30	31
Feeding Practices								
Feed bought/cow	$452	$419	$430	$426	$427	$424	$376	$424
Lbs. concentrate fed	5,649	5,525	5,871	6,155	6,093	6,231	6,264	6,286
Feeding index	119	116	122	121	121	120	121	122
Rate of roughage feeding	2.4	2.3	2.4	2.3	2.3	2.3	2.3	2.4
% NE from concentrates	47%	48%	48%	50%	50%	50%	49%	49%
% NE from succulents	31%	30%	29%	32%	32%	33%	33%	37%
% NE from dry hay	15%	14%	14%	12%	11%	10%	12%	8%
Breeding practices								
% days in milk	86%	86%	86%	87%	86%	86%	87%	87%
Proj. calving interval (mo.)	13.0	12.9	12.8	13.0	12.9	13.0	13.1	12.8
Average days dry	61	60	64	60	63	59	58	58
Breedings per conception	1.8	1.7	1.7	1.8	1.7	1.7	1.7	1.7
Av. age at first calving	28	29	29	29	29	29	28	29
Av. age all cows	52	55	55	54	54	53	55	52
Av. weight first calving	1,100	1,090	1,080	1,100	1,110	1,110	1,140	1,110
Av. weight all cows	1,250	1,250	1,230	1,240	1,260	1,260	1,290	1,270
% leaving herd	33%	31%	29%	31%	31%	27%	28%	31%

Table 47. SELECTED BUSINESS FACTORS BY POUNDS MILK SOLD PER COW
370 New York State Dairy Farms, 1978

Factor	Pounds Milk Sold Per Cow							
	Less Than 10,000	10,000 to 10,999	11,000 to 11,999	12,000 to 12,999	13,000 to 13,999	14,000 to 14,999	15,000 to 15,999	More Than 16,000
Number of farms	9	13	24	50	69	72	75	58
% of farms	2%	3%	6%	13%	18%	19%	20%	15%
Labor & Mgt. Income/Oper.	$10,193	$ 3,584	$19,769	$18,503	$19,487	$23,752	$22,413	$25,154
Barn Type								
% with free stalls	11%	7%	20%	40%	31%	43%	24%	36%
Size of Business								
Man equivalent	2.0	2.0	2.1	2.3	2.4	2.6	2.4	2.7
Total crop acres	133	194	186	217	212	243	201	220
Number of cows (FBS)	49	53	57	63	69	79	69	68
Total capital	$205,252	$260,091	$248,892	$259,911	$300,732	$350,471	$337,230	$348,813
Rates of Production								
Lbs. milk sold/cow	8,657	10,823	11,839	12,744	13,672	14,659	15,442	16,815
Tons hay crops/acre (H.E.)	2.3	2.5	2.1	2.1	2.6	2.6	2.6	2.7
Tons corn silage/acre	11.9	13.3	12.4	14.4	14.0	14.0	14.4	14.6
Labor Efficiency								
Lbs. milk sold/man	212,100	343,073	324,423	356,844	389,835	448,876	440,289	428,240
Cows/man	25	24	27	28	29	31	29	25
Feeding Practices								
Feed bought/cow	$283	$423	$353	$368	$401	$438	$469	$458
Lbs. concentrate fed	4,249	5,745	5,266	5,147	5,797	6,224	6,504	6,943
Feeding index	124	118	125	119	123	122	120	117
Rate of roughage feeding	2.4	2.3	2.3	2.3	2.3	2.4	2.4	2.3
% NE from concentrates	45%	48%	47%	46%	48%	49%	50%	53%
% NE from succulents	26%	29%	28%	31%	34%	35%	32%	31%
% NE from dry hay	18%	14%	15%	14%	12%	10%	11%	11%
Breeding Practices								
% days in milk	87%	86%	84%	86%	86%	87%	87%	87%
Projected calving interval (mo.)	13.4	12.8	12.3	13.2	13.0	12.7	12.9	13.0
Average days dry	65	62	70	62	60	59	60	57
Breedings per conception	2.0	1.7	1.6	1.7	1.6	1.8	1.8	1.7
Av. age at first calving	27	29	30	31	29	29	29	28
Av. age all cows	52	54	55	57	54	53	53	51
Av. weight first calving	960	1,110	1,090	1,080	1,090	1,120	1,120	1,130
Av. weight all cows	1,080	1,260	1,220	1,240	1,250	1,270	1,270	1,290
% leaving herd	37%	30%	32%	28%	29%	30%	30%	31%

Table 48. SELECTED BUSINESS FACTORS BY SIZE OF HERD
370 New York State Dairy Farms, 1978

Factor	Number of Cows in Herd						
	Under 40	40-54	55-69	70-84	85-99	100-149	Over 150
Number of farms	53	109	76	48	21	50	13
% of farms	14%	29%	20%	12%	5%	13%	3%
Labor & Mgt. Income/Oper.	$12,083	$16,859	$18,234	$21,355	$27,945	$30,181	$38,659
Barn Type							
% with free stalls	7%	10%	19%	43%	66%	82%	100%
Size of Business							
Man equivalent	1.7	1.9	1.9	2.7	2.7	3.8	5.3
Total crop acres	99	156	162	251	259	348	497
Number of cows	32	47	61	75	91	119	181
Total capital	$152,187	$230,515	$282,880	$355,683	$378,934	$503,847	$830,126
Rates of Production							
Lbs. milk sold/cow	13,853	14,015	14,354	14,637	14,597	14,337	14,702
Tons hay crops/acre (H.E.)	2.3	2.3	2.5	2.6	3.1	2.6	2.7
Tons corn silage/acre	13.3	13.8	13.8	14.2	15.4	14.8	13.7
Labor Efficiency							
Lbs. milk sold/man	265,449	343,073	389,156	411,161	497,491	454,960	506,876
Cows/man	19	24	27	28	34	32	34
Feeding Practices							
Feed bought/cow	$437	$423	$412	$402	$456	$407	$454
Lbs. concentrate fed	5,505	5,745	5,879	6,588	6,411	6,425	6,709
Feeding index	116	118	121	124	122	123	122
Rate of roughage feeding	2.3	2.3	2.4	2.4	2.3	2.3	2.2
% NE from concentrates	48%	48%	48%	50%	49%	51%	54%
% NE from succulents	21%	29%	32%	35%	37%	42%	45%
% NE from dry hay	20%	14%	13%	9%	8%	5%	1%
Breeding Practices							
% days in milk	85%	86%	86%	87%	87%	87%	88%
Projected calving interval (mo.)	12.8	12.8	12.8	13.1	13.0	13.1	13.2
Average days dry	65	62	59	60	58	57	56
Breedings per conception	1.7	1.7	1.7	1.7	1.7	1.8	1.8
Av. age at first calving	28	29	30	30	29	29	28
Av. age all cows	55	54	55	54	52	53	48
Av. weight first calving	1,090	1,110	1,100	1,110	1,110	1,110	1,110
Av. weight all cows	1,230	1,260	1,250	1,250	1,260	1,270	1,260
% leaving herd	30%	30%	29%	30%	29%	30%	35%